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**Development and validation of the ADAS scale and prediction of attitudes towards
affective-sexual diversity among Spanish secondary students.**

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Abstract

Violence against non-heterosexual adolescents in educational contexts remains a worrying reality, but no adequate attitudes towards affective-sexual diversity (AtASD) measure exists for Spanish adolescent students. We developed a 27-item scale including cognitive, affective and behavioral aspects, which was completed by 696 secondary school students from the Madrid area. Factor analyses suggested a unidimensional model, Cronbach's alpha indicated excellent scale scores reliability, and item calibration under the Item Response Theory framework showed that the scale is especially informative for homophobic attitudes. A hierarchical multiple regression analysis showed that variables traditionally related to AtASD (gender, age, religion, nationality, perceived parental/peer attitudes, direct contact with LGB people) also were so in our sample. Moreover, interest in sexuality topics and perceived center's efforts to provide AtASD education were related to better AtASD. Our scale was reliable and valid, and it may also prove useful in efforts to detect those students with homophobic attitudes and to guide interventions.

Keywords: sexual orientation, homophobia, education, affective-sexual diversity, LGBT.

Introduction

‘And I would tell myself: the only way out of this suffering is suicide. I stop suffering, my family stops suffering, and everyone at school is happy because they don’t have a fag there anymore’ (FELGTB, 2013, p. 35).

Verbal and physical violence against non-heterosexual adolescents in educational contexts remains a worrying reality. An alarming proportion of Spanish high school students show strong prejudices against lesbian, gay, and bisexual (LGB) persons, as well as homophobic behaviors (COGAM, 2013). Nearly half of the Spanish LGB population suffers homophobic bullying almost on a daily basis and many of them have considered suicide or have even attempted it (FELGTB, 2013). However, no adequate instrument is available for the measurement of such homophobic attitudes in the Spanish educational context. Our study seeks to provide the Spanish educational community with an assessment tool both to help consider the need for interventions and their content.

The first definition of the term homophobia described it as ‘the dread of being close to homosexuals’ Weinberg (1972, p. 8). Definitions in more recent literature also consider cognitive and contextual aspects, and homophobia has been regarded as a personality trait, a behavior, a value, an explicit or implicit attitude, a feeling, an irrational fear, and a cultural phenomenon (Costa, Bandeira, & Nardi, 2013). In this study, we understand homophobia as a more comprehensive sexual prejudice, that is, as the negative attitudes toward an individual because of her or his sexual orientation (e.g., LGB people; Herek, 2000). Such attitudes have three components (i.e, cognitive, affective and behavioral), and may be expressed in a variety of ways: from manifest behaviors of physical and verbal violence (classic or old-fashioned homophobia), to a subtler and more institutionalized rejection (liberal or modern homophobia, which is currently more typical; Rodríguez-Castro, Lameiras-Fernández,

Carrera-Fernández, & Vallejo-Medina, 2013; Morrison & Morrison, 2002; Pichardo, 2007; Platero Méndez & Gómez Ceto, 2007).

Different variables have been found to be related to attitudes towards affective-sexual diversity (AtASD). Costa et al. (2013) found in their review that homophobic attitudes are consistently related to male gender, older age, lower formal education, religiosity, no previous contact with LGB people, and perceptions that peer attitudes are negative. Additionally, some differences in relation to nationality have emerged – compared to Spaniards and other immigrants, those coming from Morocco and Romania held the highest degree of hostility towards LGB persons (INJUVE, 2010).

As for direct contact with LGB people, it is directly related to better AtASD (Brown & Henriquez, 2008; Rodríguez-Castro et al, 2013), as the influence of stereotypes and generalist categorizations on attitudes is reduced when personal knowledge of those people happens. It seems, though, that direct contact is not the only way of reducing stereotypes, as literature also shows that students' prejudices and hostile attitude are reduced if they are provided with affective-sexual diversity education (INJUVE, 2010). From this perspective, high schools' educational efforts are bound to improve the AtASD of their students. We also deem possible a relation between students' attitudes and their interest and self-perceived knowledge about sexuality, as those more interested would benefit more from affective-sexual education and, thus, would accrue more knowledge on the topic.

Lastly, parents also constitute an important source of influence on attitudes towards sexual diversity, with a positive correlation noted between the students' levels of homophobia and their families' (Buston & Hart, 2001; Espelage, Aragon, Birkett, & Koenig, 2008). Mass media have been shown to exert an influence on these attitudes and it could be greater than that of parents, since adolescents hear more about sexual diversity from the media than from their families (Calzo & Ward, 2009). Indeed, Cao, Wang, and Gao (2010) found that most of

their sample's first contact with the notion of homosexuality was through mass media. Therefore, the presence of LGB people (real or fictional) in mass media could impact adolescents' AtASD.

Although homophobia is still present in Spain, little research has addressed this topic, especially in secondary education settings (INJUVE, 2008; Pichardo, 2007; Rodríguez-Castro et al., 2013). Available data show that the Spanish educational system is not a safe place for LGB youth, as around half the students consider contempt for LGB people as justified, and a high percentage of LGB students have been excluded, threatened, and subjected to verbal and physical violence by their classmates (FELGTB, 2013; Pichardo, 2007). Important consequences stem from suffering homophobia at school, as LGB youth have a higher probability of lower academic success, more school sanctions, personal suffering (e.g., feeling humiliated, impotent, sad, and lonely), social isolation and exclusion, and even suicide (FELGTB, 2013; Hatzenbuehler, 2011; Hatzenbuehler, Phelan, & Link, 2013; Ryan, Huebner, Díaz & Sánchez, 2009). In addition, they receive less social support from their families than other minority groups (Halkitis, Wolitski, & Millett, 2013), placing them at increased risk.

However, despite the adverse effects of homophobic bullying, little research has focused on the attitudes of secondary education students. Costa et al. (2013) reviewed the homophobia assessment literature and found that all the studies conducted with the four most used instruments were with post-secondary students, which comes as a limitation since higher formal education is inversely related to prejudice. In addition, these instruments fail to measure the same construct, as some of them include some homophobia components but not others (i.e., cognitive, affective, and behavioral). For instance, the Index of Homophobia (Hudson & Ricketts, 1980), which emerged as the best quality instrument, only measures the affective component, and the second best instrument, The Attitudes Toward Lesbians and

Gay Men scale (Herek, 1988), fails to include bisexuality and so does not represent affective-sexual diversity but only homosexuality.

In Spain, Rodríguez-Castro et al. (2013) validated the Modern Homophobia Scale (Raja & Stokes, 1998), comprised of 46 items. This instrument addresses the more current subtle forms of homophobia and the validation was made with secondary students from a north-west county in Spain. However, it presents some shortcomings.

First, the authors acknowledge that the translation method used was not highly recommended. We also believe that additional measures should have been taken to ensure that the scale (originated in the US 15 years before) was culturally appropriate. Second, it only considers homosexuality, and thus also fails to take a wider sexual prejudice into account. Third, we think that its extensive length makes administration in educational settings difficult.

Lastly, the authors used Structural Equation Modeling to study the scales structural validity, reporting only three model fit indices (χ^2/df , RMSEA, and AGFI), without considering relative fit indices (e.g., CFI, TLI). More importantly, the current consensus is not to use AGFI (Sharma, Mukherjee, Kumar, & Dillon, 2005), as its value increments with sample size. Despite the fact that the sample of Rodríguez-Castro et al.'s study (2013) was large ($N = 800$), AGFI values were below the typical cutoff points (over .90 is considered acceptable and over .95 good; Hair, Black, Babin, Anderson, & Tathan, 2010), which questions the acceptability of the model.

Given the little research that exists in the Spanish context, it is of paramount importance to systematically study students' perceptions of affective-sexual diversity so that educational interventions can be implemented to prevent homophobic bullying. Therefore, the main objective of the present study was to develop and validate a culturally meaningful assessment tool for measuring AtASD with secondary education students in Spain.

Concerning the validity of the measure, this work sought to study how several variables contributed to explain AtASD (i.e., gender, age, religion, country of origin, perceived attitudes of parents and peers, direct contact with LGB people, interest on sexuality topics, self-perceived knowledge about sexuality, perceived educational efforts of the high school, and number of real or fictional LGB mass media characters).

Method

Participants

The target population of this study was high school students from 8th to 10th grade (ESO in the Spanish educational system, age range 13-16). The initial sample consisted of 696 high school students from five public high schools placed in Alcobendas, San Fernando de Henares, Parla, and Coslada, all of them in Madrid County. The students were selected by random selection, depending on the center's class timetable availability.

Participants completed the Attitudes towards Affective-Sexual Diversity scale (ADAS, from its abbreviation in Spanish). The responses of students who omitted four or more items or did not provide the sociodemographic information (such as age, gender or nationality) were removed from the sample. The final sample included 676 participants (344 male and 332 female) aged between 13 and 18 years old ($M = 14.48$, $SD = 1.17$). Most of them were of Spanish origin ($N = 547$), 85 were from different South American countries, 31 were from countries of Eastern Europe and there were seven from other countries, such as India or China.

Instruments

ADAS scale. It has 27 items to measure AtASD with a Likert-type response format ranging from 1 to 4 (*strongly disagree*, *somewhat disagree*, *somewhat agree*, and *strongly agree*). Scale items can be found in Table 1 and the Procedure section addresses its development.

Sociodemographic questions. Participants indicated their gender (male/female/other), age, nationality (operationalized as region of origin such as Spain, South America, East Europe, or Asia) and religion (operationalized as Christian or Atheist, the two most common answers).

Other variables of interest. Participants were asked about the opinions of their friends and parents about homosexuality and bisexuality; their own interest in sexuality; self-perceived knowledge about sexuality; perceived efforts of their school to address the topic of affective-sexual diversity; the number of homosexual or bisexual people with who they had contact; and the number of real or fictional media characters with a non-heterosexual orientation they knew. Except for the last question, which was answered by writing the raw number, these questions had a 4-point Likert-type response format (e.g., 1 = *Very little*, 4 = *A great deal*).

Procedure

An instrumental design (Montero & León, 2007) with a cross-sectional two-stage cluster sampling was employed in this study. To address the measurement of AtASD, we developed a quantitative instrument composed of 32 items and included a similar number of cognitive, affective and behavioral items to ensure representativeness of the different attitude components. The most common and noteworthy affective-sexual orientations were considered, that is, homosexuality (male and female) and bisexuality, leaving out other possibilities (e.g., pansexuality, polysexuality, or asexuality), as they could be not known by the target sample or not clear enough for them. Transgenderism was also left out as it refers to sexual identity and not affective-sexual orientation. Relevant item content was suggested by two experts with theoretical knowledge who worked on the field of affective-sexual diversity in secondary schools and a psychometric expert reviewed item phrasing and made improvements. The response format of the items was a 4-point Likert-type scale, keeping the

minimum number of response categories to simplify the participants' task (Lozano, García-Cueto, & Muñiz, 2008). The items were counterbalanced to avoid acquiescence bias, with some statements positively worded and others negatively worded.

Eighteen Spanish expert judges were invited to assess the items so as to ensure the content validity and cultural appropriateness of the test. The judges were academic experts with several publications in the field of homosexuality or homophobia in educational settings, or acknowledged professionals who worked actively in the field. Eleven judges completed the assessment, which consisted of evaluating how appropriate the item statements were to measure the construct using a Likert-type scale ranging from 1 (*very inappropriate*) to 7 (*very appropriate*), and to which dimension each item corresponded (i.e., cognitive, affective or behavioral). Items with mean values lower than 5 in the appropriateness scale (the category in which the 'appropriate' response begins) or whose dimension was misrated by five or more of the eleven experts were eliminated from the final test. The average of the appropriateness ratings of the experts for the scale was 5.66, with a standard deviation of 0.75. Four items were below the aforementioned cut-off, and only one item was misclassified by five experts. These five items were removed from the scale, while the remaining 27 showed a substantial relevance to measure AtASD.

In order to approach the participants, we contacted the centers, gave an official letter to the headmasters, and explained the study to them. The centers which agreed to participate informed the students' parents or legal guardians. None were opposed to the participation of their children. The test was administered by the researchers during regular lessons and we responded to any questions the participants had.

Data Analysis

To study the psychometric properties of the ADAS scale, the following analyses were carried out. Descriptive analyses were obtained for all items (mean, *SD*, range, etc.), as well

as the item-test corrected correlations and the internal consistency of the test by means of Cronbach's alpha.

We also conducted factor analyses to assess construct validity. A parallel analysis with the polychoric correlation matrix based on minimum rank factor analysis was conducted to determine the number of factors to extract (Timmerman & Lorenzo-Seva, 2011). Two factorial models with theoretical sense were then proposed to be tested by a confirmatory factor analysis: a unidimensional model (as the parallel analysis suggested) and a three correlated factors model (cognitive, affective and behavioral factors). Given the categorical nature of the data and the negatively asymmetric distributions of the items, the WLSM method, a robust version of the WLS estimator, was utilized to estimate the models. We used the CFI and the TLI indices to assess the fit of the model, following the criteria proposed by Hu and Bentler (CFI/TLI > .95; 1998). The RMSEA and the SRMR were used to evaluate the residuals of both models. RMSEA values lower than .05 and .08 indicate good and mediocre fit, respectively (MacCallum, Browne & Sugawara, 1996), and SRMR values less than .08 imply an acceptable fit (Hu & Bentler, 1998).

Once the factorial structure was delimited, the items were calibrated under the Item Response Theory (IRT) framework, which offers some advantages compared to the classical psychometric approach (see Lord & Novick, 1968). First, the properties of the items – such as difficulty (or item position in attitude scales) or discrimination – remain constant from one sample to another inside the same population. Second, the item and the person parameters are in the same scale – logistic – so it is possible to determine which item is most appropriate (informative) for each latent trait level. Third, and derived from the previous advantage, the sum of information of each item results in the total information of the test, which is very convenient to delimit the latent trait levels for which the instrument is most precise. We applied the graded response model (Samejima, 1969), under which each item has a

discrimination parameter (a) and three threshold or position parameters (b_k). Threshold parameters demarcate the point in the latent trait continuum in which the probability of choosing one item category is higher than the others for a given respondent. Discrimination parameters inform about how likely participants are to choose an item category if their score is above or below the estimated threshold. Participants' IRT scores (i.e., AtASD estimate) were returned in logistic metric.

Finally, we studied the relationships between participants' IRT scores and the other theoretically related variables by means of Spearman correlations, given the ordinal nature of most these variables. Then, a hierarchical stepwise multiple regression analysis was carried out taking the IRT score of the ADAS scale as dependent variable in order to assess the validity of the scale and to study the relations of this construct with other variables in more depth. The first block of contributors included sociodemographic variables; gender, religiosity, and region of origin were dummy coded before being entered in the model. The second block incorporated those variables related to direct and important sources of potential influence on the forming of attitudes (proximal contributors; i.e., perceived parental opinion, perceived peers' opinion, and direct contact with LGB people). Finally, a third block composed of other related variables (distal contributors) was added to the model, which included the perceived amount of knowledge about sexuality, interest in sexuality topics, perceived degree of intervention of the educational center (as an indirect measure of how much effort the centers have made to tackle affective-sexual diversity), and number of real or fictional LGB media characters they knew.

Analyses were conducted with the software *R* (R Core Team, 2015), except the parallel analysis, which was conducted with the software *Factor* (Lorenzo-Seva & Ferrando, 2006). The *R* package *psych* (Revelle, 2015) was used for the descriptive and reliability analysis,

whereas the *lavaan* (Rosseel, 2012) and the *mirt* (Chalmers, 2012) packages were used for the confirmatory factor and the IRT analyses.

Results

Descriptive analyses and Reliability

The descriptive analyses (see Table 1) revealed that the items are slightly displaced to the right (mean range 2.5–3.69 with a mean standard deviation around .80), so participants tended to agree with the positive items and to disagree with the negative ones. The correlations between the items and the rest of the test were moderately high, ranging from .33 to .76, which suggests that the items are strongly related to the measured construct. The scale Cronbach's alpha was .94, indicative of a high internal consistency.

[INSERT TABLE 1]

Factorial Validity

To assess construct validity, we conducted a parallel analysis which suggested the extraction of a single factor (the percentage of explained variance of the first factor was superior compared to the mean and the 95% percentile of the simulated random correlation matrices; see Figure 1).

[INSERT FIGURE 1]

With this result in mind, we proposed two theoretical models (Figure 2). In the first model (Figure 2a), all the items loaded onto a single factor. The second model (Figure 2b) was the one initially expected by the authors: a correlated three-factor model, in which each item loaded only on one dimension (cognitive, affective or behavioral). The fit indices of the unidimensional model were acceptable (CFI = .96, TLI = .96, RMSEA = .06, SRMR = .05). The fit indices of the three-factor model (CFI = .97, TLI = .96, RMSEA = .06, SRMR = .05) were also inside the limits that allow to accept it. However, the correlations between the three factors were very strong (from $r_{xy} = .89$ to $r_{xy} = .95$), implying that they might be measuring

the same construct, so we decided to apply the parsimony principle and keep the simplest model: the unidimensional one.

IRT Analysis

The threshold parameters (b_k) covered low, moderate, and mid-high levels of the latent trait (AtASD), as shown in Table 1. These values represent the point on the latent trait continuum in which the probability of endorsement between two adjacent categories is .50. Thus, respondents with AtASD estimates higher than a given threshold parameter value would more likely endorse the item category above that threshold parameter. For instance, respondents with an AtASD estimate of 1, would more likely endorse the upper category (*strongly agree*) when answering item 10, since their AtASD estimate is far above the threshold parameter value between the third and fourth categories (b_3) of this item. However, if their AtASD estimate was -1 , then they would tend to endorse the third category (*somewhat agree*), since the AtASD estimate is between the b_2 and b_3 parameters.

Concerning the discrimination parameters (a) of the items, these were high in all cases, with most of the values above 1.50. The higher this parameter value is, the less likely it is for respondents to choose a category above or below their AtASD estimate, thus supporting the accuracy of the threshold parameters (b) previously commented.

Finally, Figure 3 shows the test information function. The information function highlights that the ADAS items discriminate participants' attitudes fairly well in the negative area of the latent trait (i.e., more homophobic attitudes), reaching a high precision of the measure in these values of the assessed latent trait (AtASD).

[INSERT FIGURE 3]

Criterion-related Validity

To study the relation of AtASD to other variables, Spearman correlations were computed (see Table 2). AtASD estimates were strongly related to parental opinion and direct

contact with LGB people. Moderate relations were also found between AtASD and peers' opinion, number of LGB characters known from the media, and perceived efforts made by the center.

[INSERT TABLE 2]

A hierarchical stepwise multiple regression analysis was also carried out (see Table 3). The initial model, which only considered the sociodemographic variables, obtained a relatively high determination coefficient (adjusted $R^2 = .20$), in which the significant variables were male gender, $\beta = -.82$, $t(626) = -11.87$, $p < .001$; being Christian, $\beta = -.17$, $t(626) = -2.35$, $p = .02$; and age, $\beta = .06$, $t(626) = 2.05$, $p = .04$. Nationality was also significant for those participants coming from South America when compared to Spaniards, $\beta = -.27$, $t(626) = -2.53$, $p = .01$. These variables explained 19.51% of the test score's variability.

[INSERT TABLE 3]

In a second step, a block of psychologically relevant variables (proximal contributors; i.e., parents' opinion, peers' opinion, and direct contact with LGB people) was added to the regression model, resulting in an increase of the determination coefficient (adjusted $R^2 = .36$; $\Delta R^2 = .17$, $p < .001$), increasing the explained variance up to the 36.08%. Moreover, religiosity became non-significant, $\beta = -.02$, $t(604) = .34$, $p = .73$, as well as nationality, $\beta_{\text{EasternEurope}} = -.08$, $t(604) = .38$, $p = .70$; $\beta_{\text{SouthAmerica}} = -.04$, $t(604) = -.44$, $p = .66$; $\beta_{\text{Other}} = -.27$, $t(604) = -.60$, $p = .55$. The effect of male gender in the model was decreased, whereas the effect of age remained the same. On the other hand, the inclusion of direct contact with LGB people, $\beta = .21$, $t(604) = 5.80$, $p < .001$, perceived parental opinion, $\beta = .45$, $t(604) = 8.98$, $p < .001$, and perceived peers' opinion, $\beta = .13$, $t(604) = 2.66$, $p < .01$, were significant, meaning that as the scores on these variables became higher, the attitude towards affective-sexual diversity tended to become more positive (i.e., less homophobic).

Finally, a third block of variables (distal contributors) was added to the model (i.e., interest about sexuality, perceived degree of intervention of the educational center, self-perceived knowledge about sexuality, and number of real or fictional LGB people known). At this point, age became non-significant, $\beta = .03$, $t(577) = 1.26$, $p = .21$, while gender and the variables from the second block remained present with similar coefficients. Two of the four new variables were statistically significant – interest in sexuality topics, $\beta = .08$, $t(643) = 2.30$, $p = .02$, and the perception of how much the educational center has addressed the topic, $\beta = .08$, $t(643) = 2.19$, $p = .03$ – which increased the amount of explained variance to 36.5% (adjusted $R^2 = .37$; $\Delta R^2 < .01$, $p < .01$). Semi partial correlations were computed for all significant variables, resulting in semi partial correlation values above .05 in all cases. Thus, all variables met the size effect requirements to be included in the model.

Discussion

The ADAS scale has been shown to possess several strengths. It is not merely a translation of a measure designed for a different cultural and educational context – it was developed especially for the Spanish secondary education setting, taking into account contents deemed by experts as relevant to that particular context. Moreover, it considers not only homosexuality but also bisexuality, and so it addresses a broader concept of affective-sexual diversity than most measures do. Regarding the psychometric properties of its scores, they have shown excellent reliability and measure a coherent unidimensional construct. The ADAS scale has been proven to be particularly useful to detect lower AtASD (that is, higher homophobic attitudes). Therefore, it can be used to identify those contexts in need of an affective-sexual diversity-related intervention and also to monitor attitudinal changes during the intervention.

The ADAS scale score has shown associations with the same variables that the literature has traditionally reported as related to AtASD (i.e., sex, religiosity, age, nationality, parental opinion, peer opinion, and direct contact with LGB people; Brown & Henriquez, 2008; Buston & Hart, 2001; Costa et al., 2013; Espelage et al., 2008; INJUVE, 2010; Rodríguez-Castro et al, 2013). Furthermore, our hierarchical regression analysis showed that, when considered together, certain variables had a greater contribution in the explanation of AtASD variance. Specifically, the variables more intensely related to AtASD were male gender, parental opinion, and direct contact with LGB people. Our results also indicated that religiosity, nationality, and age lost their predictive power when taken into account along with other variables. This fact could be due to other variables capturing part of the variance, e.g., parental opinion may capture the effect of religiosity or nationality, as it could be the transmission vehicle of religious or cultural values. These results have important implications for intervention (e.g., nationality and religiosity are unchangeable or unethical to modify, but parents can more easily be made participants of an educational program) that we will further discuss.

Lastly, in accordance with previous literature (INJUVE, 2010), the perceived effort of the educational center to provide affective-sexual diversity education was also associated with AtASD, which has obvious implications for intervention. Data also supported our hypothesis of the relation between AtASD and interest of the student in sexuality topics, but perceived knowledge about sexuality and indirect contact with LGB media characters did not show an association with AtASD. It seems, thus, that taking an interest in sexuality may open paths for respectful attitudes, whereas actual knowledge about a topic or knowledge of media characters may not relate to AtASD because they can constitute circumstantial knowledge that does not translate into attitudinal change.

Our study has provided a reliable and valid AtASD measure, which can be used both in Spanish educational settings and research. Moreover, the measure is shorter than other available scales in Spanish (e.g. Rodríguez-Castro et al., 2013), which increases the ease and convenience of its application. The quantitative framing of the study also offers a complementary perspective in a field where qualitative data are typical (e.g., COGAM, 2013; INJUVE, 2010; Pichardo, 2007). Additionally, the use of IRT in the measurement of AtADS opens a new perspective on the study of homophobic attitudes. IRT offers some major advantages compared to more classical analytical approaches, as it includes improved factor scores estimators, and does not assume measurement precision to be constant (Chernyshenko, Stark, Chan, Drasgow, & Williams, 2001; Glockner-Rist & Herbert Hoijtink, 2003). The ADAS scale is especially informative for low and very low levels of AtADS (i.e., homophobic attitudes), and thus can be utilized to identify intervention targets and design new class intervention programs.

However, this study is not without limitations. The cross-sectional design prevented the exploration of the directionality of the associations, so a causal model remains to be tested. In addition, as we did not include any commonly used homophobia measure in our study, convergent validity of the ADAS scale could not be established, which also constitutes a limitation. The fact that data collection was carried out in the Madrid area limits the generalizability of the results to populations in other regions, especially in rural areas. Social desirability could have affected participants' responses, although anonymity and confidentiality were ensured. Finally, we are aware that, although our measure is shorter than others available for the Spanish context, efforts could and should be directed to the reduction of its length. Further research should consider and overcome these limitations to advance knowledge on AtASD in secondary education populations, especially concerning the convergent validity of the scale and the reduction of the number of items, so as to improve its

applicability in school settings. Regarding the latter, we would recommend the use of the IRT framework, specifically of linear optimization techniques (Diao & van der Linden, 2011).

Our work has important implications. LGB students are at increased risk of suffering or even ending their lives. They usually do not disclose their sexual orientation, they do not seek help from family or friends, they do not contact associations or groups, and their internalized stigma is increased by experienced homophobia and negative reactions to disclosure (Elleker, 2015). Thus, measuring homophobia in the classroom to detect intervention needs is of paramount importance. Concretely, efforts can be made to (1) assess the levels of homophobia in each class and then to (2) improve the situation for LGB students by addressing key topics in the class and also in the school so as to reduce homophobic attitudes.

Our study can assist in the achievement of these two objectives in Spanish educational settings by (1) allowing the measurement of AtASD in the classroom or school with a validated instrument, and then by (2) helping teachers and school counselors identify areas for intervention and intervention targets. With respect to the latter, the examination of the item responses in each class or school to the ADAS scale can guide intervention design – for instance, by helping decide what contents it is more necessary to stress. Also, the examination of the scale scores can allow teachers to know which students have the most negative attitudes towards LGB people, which can also be of aid in intervention implementation (i.e., in group activities, the selected homophobic students can be placed with students who support affective-sexual diversity so that they can hear different ideas and opinions).

Our results have also identified key elements that should be taken into account in the design and implementation of interventions. First, educational efforts aimed at improving AtASD in secondary school students should probably be hosted at the educational center, as

both better peers' attitude and perceived effort of the school emerged as significant predictors of more positive AtASD. Second, interventions would benefit from including not only the students but also their parents, since the perceived parental opinion was a significant predictor and one of great magnitude. Third, interventions should provide the opportunity of meeting LGB people as part of the program, as well as foster a healthy interest in affective-sexuality related topics. For instance, interventions could be delivered by LGB volunteers so as to provide a direct contact with these people. Lastly, intervention designers and facilitators should consider the fact that male students have worse AtADS than females both in defining the content of the intervention and in its delivery.

Some ground was advanced in Spain in 2006 at the institutional level when the Royal Decree 1631/2006 was approved and affective-sexual diversity was supposed to be taught during secondary education. However, this effort was soon abandoned following a political change, and educational actions in this regard have been dependent on the interest of certain educational centers or individual teachers, often in the form of talks offered by volunteer-based non-profit organizations. Despite the fact that affective-sexuality is transverse along all the person's life and that some teaching materials have been published (Sánchez Sáinz, 2010), these topics are even less considered in primary education, where almost no affective-sexual diversity education exists. As it can be derived from the extant literature and from our own work, homophobia can have devastating consequences for the people suffering it, yet it can be reduced if educational measures are implemented. Thus, homophobic bullying should be taken into account by the Spanish political forces and changes be again made at the institutional level.

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Table 1.

Descriptive statistics and item parameters of the ADAS scale.

Item	<i>M</i>	<i>SD</i>	<i>r</i> _{item-test}	<i>a</i>	<i>b</i> ₁	<i>b</i> ₂	<i>b</i> ₃
1. Para mí, la homosexualidad no es una enfermedad. <i>In my opinion, homosexuality is not an illness.</i>	3.44	.92	.61	2.08 (.17)	-1.79 (.23)	-1.48 (.20)	-0.55 (.14)
2. Ver a dos chicos besándose me daría asco. <i>I would find it disgusting if I saw two males kissing.</i>	2.69	1.00	.63	1.71 (.12)	-1.41 (.15)	-0.37 (.12)	1.02 (.13)
3. Si tuviera un/a compañero/a de clase homosexual o bisexual, le trataría como al resto de mis compañeros. <i>If I had a gay or bisexual classmate, I would treat them like the rest of my classmates.</i>	3.47	.74	.67	2.45 (.19)	-2.28 (.36)	-1.63 (.25)	-0.30 (.15)
4. Creo que la homosexualidad y la bisexualidad son antinaturales. <i>I think homo and bisexuality are unnatural.</i>	3.3	.90	.70	2.37 (.17)	-1.83 (.26)	-1.16 (.19)	-0.15 (.14)
5. Si uno de mis compañeros de clase fuera homosexual o bisexual, me reiría, me burlaría de él o ella o le insultaría,	3.67	.64	.61	2.33 (.20)	-2.50 (.40)	-2.04 (.31)	-0.80 (.18)

con él o ella delante. *If I had a gay or bisexual classmate, I would laugh at them, mock them, or insult them.*

- | | | | | | | | |
|--|------|-----|-----|------------|-------------|-------------|-------------|
| 6. Creo que las personas homosexuales y bisexuales son esencialmente iguales al resto. <i>I think gay and bisexual people are essentially like the rest.</i> | 3.31 | .84 | .66 | 2.21 (.16) | −1.99 (.26) | −1.34 (.19) | −0.04 (.13) |
| 7. Ver a dos chicas besándose me daría asco. <i>I would find it disgusting if I saw two females kissing.</i> | 3.16 | .88 | .32 | 0.76 (.09) | −4.04 (.18) | −1.86 (.10) | 0.47 (.09) |
| 8. Si tuviera un/a compañero/a de clase homosexual o bisexual, seguramente sería motivo de mofa o burlas entre mis amigos cuando no estuviera delante. <i>If I had a gay or bisexual classmate, my friends and I would probably mock them behind their back.</i> | 2.93 | .91 | .33 | 0.68 (.08) | −4.37 (.17) | −1.17 (.09) | 1.19 (.09) |
| 9. No deberían permitirse los matrimonios entre personas del mismo sexo. <i>Same-sex marriages should not be allowed.</i> | 3.43 | .88 | .66 | 2.30 (.18) | −1.84 (.26) | −1.35 (.21) | −0.43 (.15) |
| 10. Si uno de mis compañeros de clase fuera homosexual o bisexual, me sentiría más cómodo si evito hablar con él o | 3.19 | .85 | .70 | 2.58 (.18) | −1.94 (.30) | −1.08 (.20) | 0.19 (.15) |

ella. *If I had a gay or bisexual classmate, I'd feel more comfortable avoiding talking to them.*

11. Me parece bien que se puedan dar niños en adopción a parejas del mismo sexo. <i>I think it's fine that children are given in adoption to same-sex couples.</i>	3.27	.91	.58	1.69 (.13)	−2.01 (.20)	−1.36 (.15)	−0.05 (.11)
12. No soportaría el contacto de alguien que fuera homosexual o bisexual. <i>I couldn't stand the physical contact of a gay or bisexual person.</i>	3.26	.87	.60	1.95 (.14)	−1.98 (.23)	−1.34 (.17)	0.05 (.12)
13. No soporto a las personas con pluma. <i>I can't stand people who are camp.</i>	2.98	.97	.68	2.08 (.15)	−1.60 (.20)	−0.79 (.15)	0.45 (.13)
14. Si tuviera un/a compañero/a de clase homosexual o bisexual, le empujaría o le haría la zancadilla. <i>If I had a gay or bisexual classmate, I'd push or trip him/her up.</i>	3.65	.64	.55	2.05 (.18)	−2.68 (.37)	−2.23 (.29)	−0.74 (.16)
15. Los gays, lesbianas y bisexuales son personas promiscuas. <i>Gay and bisexual people are promiscuous.</i>	3.12	.82	.52	1.37 (.11)	−2.70 (.22)	−1.41 (.13)	0.57 (.11)
	3.33	.83	.66	2.43 (.18)	−2.04 (.30)	−1.28 (.21)	−0.08 (.14)

16. Siento rechazo por los gays, lesbianas y bisexuales. *I find*

gay and bisexual people repugnant.

17. Si uno de mis compañeros de clase fuera homosexual o 3.61 .63 .60 2.25 (.18) -2.75 (.44) -2.08 (.30) -0.60 (.16)

bisexual, le escondería, tiraría o quitaría sus cosas. *If I had a*

gay or bisexual classmate, I'd take their stuff, throw it away,

or hide it.

18. Los gays son afeminados, se comportan como chicas. *Gay* 2.56 .93 .58 1.50 (.11) -1.60 (.15) -0.16 (.11) 1.49 (.14)

men are effeminate, they act like girls.

19. Me resulta agradable estar con gays, lesbianas o bisexuales. 2.5 .84 .64 2.03 (.14) -1.40 (.18) -0.19 (.13) 1.77 (.22)

I like being around gay or bisexual people.

20. Si tuviera un/a compañero/a de clase homosexual o 3.71 .59 .58 2.24 (.20) -2.68 (.44) -2.27 (.34) -0.91 (.18)

bisexual, le daría un puñetazo o una patada. *If I had a gay*

or bisexual classmate, I'd punch or kick them.

21. Las lesbianas son unos marimachos, se comportan como 3.06 .83 .48 1.12 (.10) -3.10 (.20) -1.37 (.11) 0.80 (.10)

chicos. *Lesbians are butches, they act like boys.*

22. Siento desprecio por los gays, lesbianas y bisexuales. <i>I feel contempt for gay and bisexual people.</i>	3.46	.78	.75	3.42 (.26)	−1.88 (.44)	−1.38 (.33)	−0.29 (.19)
23. Si uno de mis compañeros de clase fuera homosexual o bisexual, le defendería si otros se metiesen con él o ella. <i>If I had a gay or bisexual classmate and others picked on them, I'd defend them.</i>	3.07	.80	.61	1.84 (.13)	−2.31 (.25)	−1.18 (.15)	0.66 (.13)
24. Me parece bien que dos personas del mismo sexo tengan una relación sentimental o sexual. <i>I think it's fine that two people of the same sex have an affective or sexual relationship.</i>	3.05	.88	.71	2.37 (.16)	−1.73 (.24)	−1.01 (.18)	0.50 (.15)
25. Me pone nervioso estar en presencia de un homosexual o bisexual. <i>Being around a gay or bisexual person makes me nervous.</i>	3.17	.85	.64	2.21 (.16)	−1.93 (.25)	−1.16 (.18)	0.30 (.14)
26. Tener padres homosexuales implica acabar siendo homosexual o bisexual. <i>Having gay parents leads to being gay or bisexual.</i>	3.36	.86	.54	1.44 (.12)	−2.61 (.22)	−1.54 (.14)	−0.24 (.11)

27. No sería capaz de hacerme amigo de un gay, lesbiana o bisexual. <i>I would not be friends with a gay or bisexual person.</i>	3.37	.86	.70	2.69 (.20)	-1.82 (.30)	-1.29 (.23)	-0.19 (.16)
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Note. M = mean. SD = standard deviation. $r_{item-test}$ = corrected item- test correlation. a = discrimination parameter with standard errors in brackets. b_k = position parameters with the standard errors in brackets.

Table 2.

AtADS correlations with other variables of interest.

	2	3	4	5	6	7	8
1. Knowledge about sexuality	-.01	.29***	.10**	.05	.02	.01	.03
2. Effort of the center		.00	.05	-.04	.15***	.06	.12**
3. Interest in sexuality			.05	.04	-.01	-.02	.02
4. Direct contact with LGB people				.17***	.08*	.19***	.34***
5. Number of LGB media characters					.09*	.11**	.15***
6. Peers opinion						.26***	.17***
7. Parents opinion							.40***
8. AtASD							

Note. AtASD = Attitudes toward Affective-Sexual Diversity. * $p < .05$. ** $p < .01$ *** $p < .001$.

Table 3.

Hierarchical multiple linear regression analysis.

	Step 1	Step 2	Step 3
	Sociodemo-	Proximal	Distal
Variable	graphics	contributors	contributors
Intercept	-.33 (.43)**	-1.65 (.41)**	-1.67 (.41)**
Gender _{men}	-.82 (.07)**	-.67 (.06)**	-.68 (.07)**
Religion _{Christian}	-.17 (.07)**	-.02 (.06)	-.03 (.07)
Country _{EastEurope}	-.34 (.21)	-.08 (.20)	.09 (.20)
Country _{LatinAmerican}	-.27 (.11)*	-.04 (.10)	-.00 (.10)
Country _{Other}	-.16 (.49)	-.27 (.44)	-.19 (.55)
Age	.06 (.03)*	.06 (.03)*	.03 (.03)
Parents opinion		.45 (.05)**	.46 (.05)**
Direct Contact with LGB people		.21 (.04)**	.20 (.04)**
Peers opinion		.13 (.05)**	.11 (.05)**
Interest in sexuality			.10 (.04)**
Effort of the center			.10 (.04)**
Knowledge about sexuality			.03 (.05)
Number of LGB media characters			.00 (.00)
R^2	.20	.36	.37
$F (df)$	26.54 (626)**	39.44 (604)**	27.08 (577)**
ΔR^2		.17	< .01
$F \text{ for } \Delta R^2 (df)$		51.78 (3)**	3.63 (4)**

Note. Unstandardized coefficients are shown with standard errors between parentheses.

Categorical variables were dummy coded and the coefficients of the first category of each (Gender_{Women}, Religion_{Atheist}, Country_{Spain}) were fixed to 0. df = degrees of freedom.

* $p < .05$. ** $p < .01$.

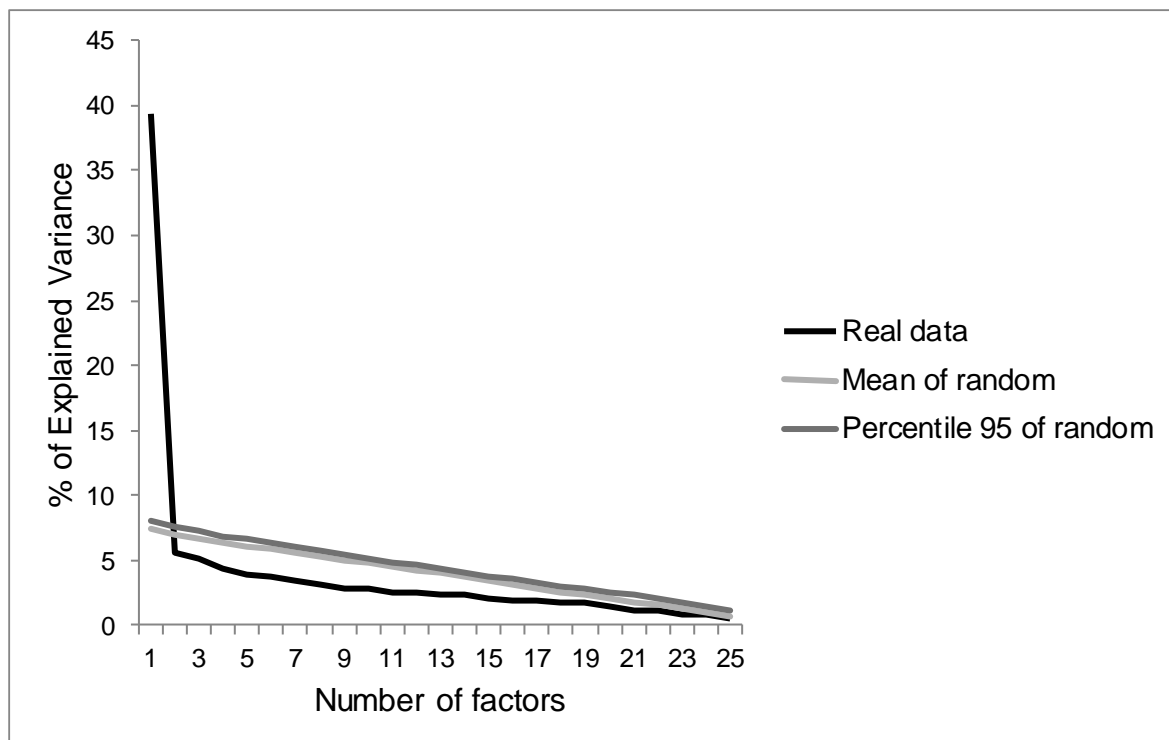


Figure 1. Parallel analysis based on minimum rank factor analysis.

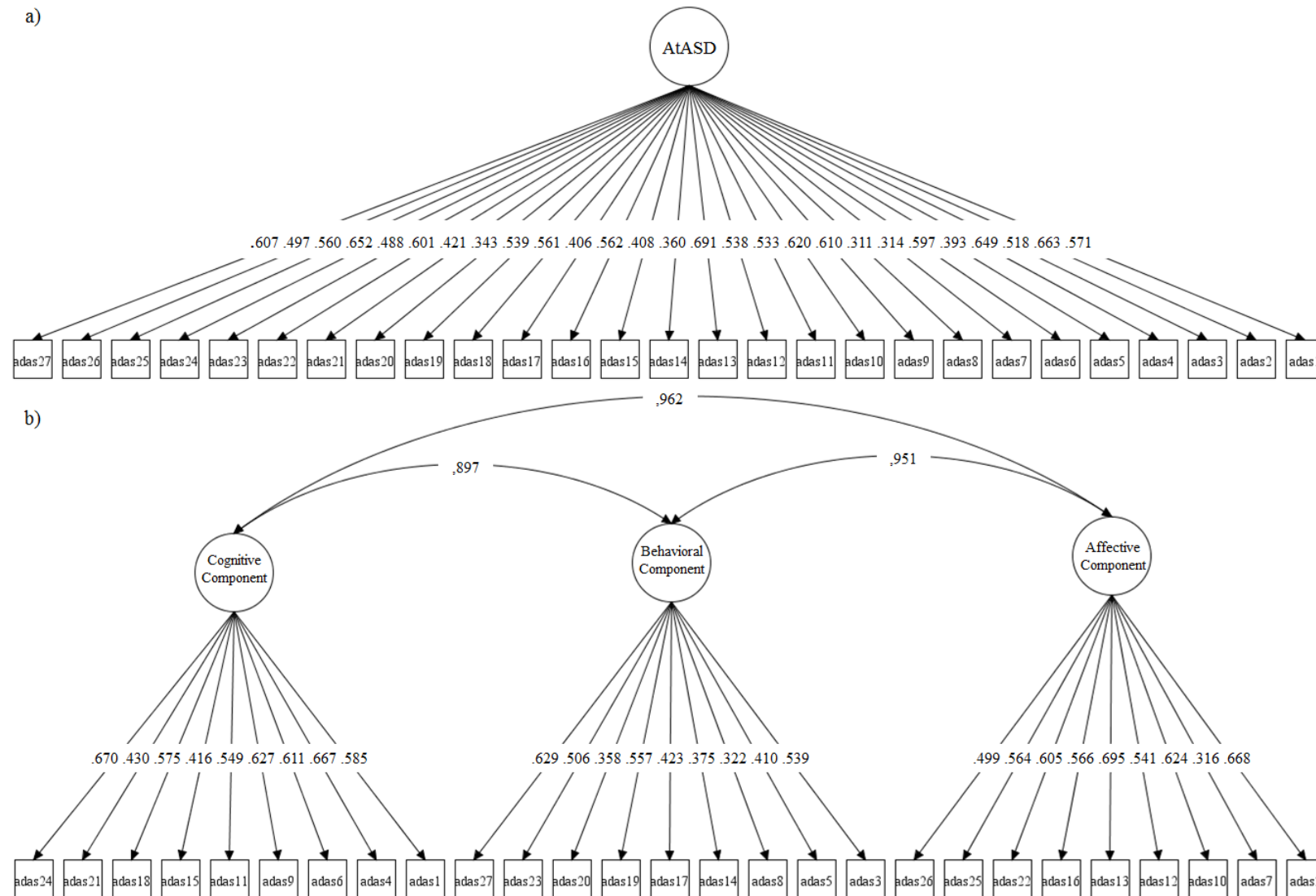


Figure 2. CFA models.

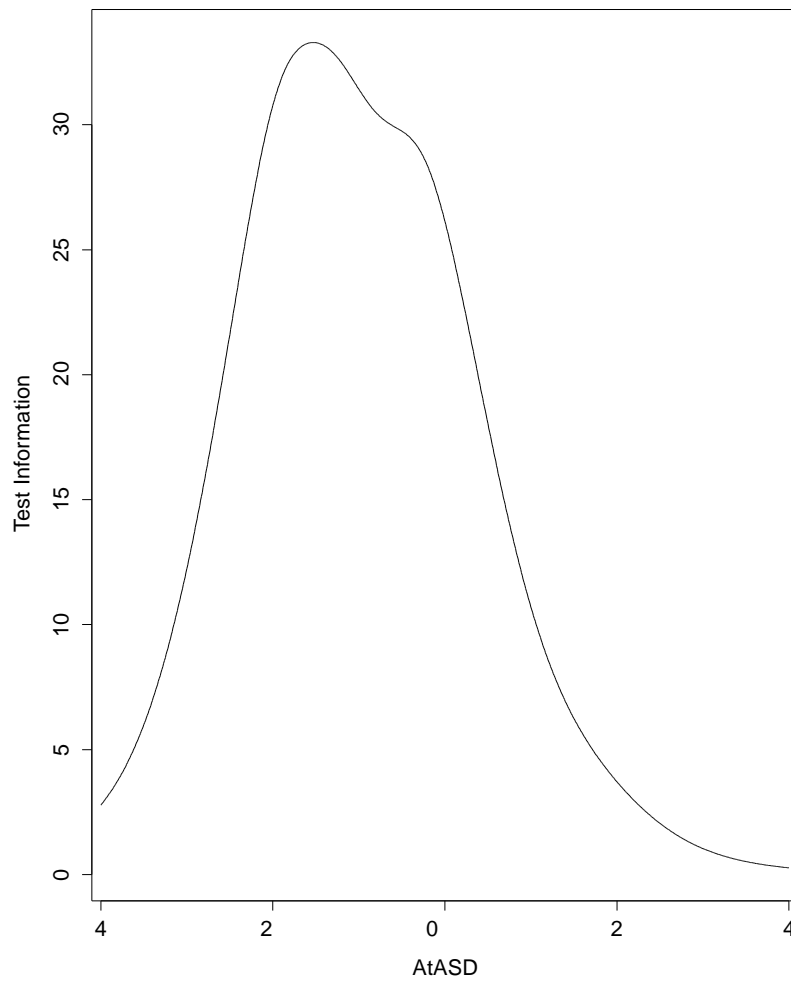


Figure 3. Test information function.